Space Weather Forecast

Issued on Thursday, 04 May 2023 at 01:19 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

Space Weather Forecast Headline: Chance of R3 Strong radio blackouts. Very slight chance of G1/Minor Storm conditions on 06 May.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has reached High levels with an increase in activity from a highly magnetically complex region in the northeast quadrant, producing five Moderate flares in relatively quick succession. This sunspot group has evolved rapidly, along with a region to the east. To the southeast of this region, but also in the northeast quadrant, another large and fairly complex region is rotating into clearer view. A long-lived sunspot group close to the southeast limb remains magnetically complex and continues to produce occasional Common-class flares. In total there are nine sunspots present on the visible disc. No Earth-directed Coronal Mass Ejections (CMEs) were observed.

Solar Wind / Geomagnetic Activity: The solar winds has slowly decreased from around 500km/s (elevated) to 440km/s (slightly elevated) during the day as the fast wind from a coronal hole high-speed stream in the far northwest eases. Total magnetic field strength was weak, with the important north-south component also varying weakly. Geomagnetic activity was Quiet throughout.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate to High activity is expected with further Moderate flares likely and a chance of isolated Strong flares occurring, mainly from the complex regions in the northeast.

Solar Wind / Geomagnetic Activity: No CMEs are expected to affect Earth during the period, however, there remains a very slight chance of glancing impacts on 04 and 05 May due to the relative proximity of previously assessed CMEs. The current high speed stream, likely from a coronal hole in the northwest is expected to continue to weaken through 04 May, with winds decreasing close to, or to background levels during the next 24 hours. The next high-speed stream is likely to connect with Earth on 06 May with speeds increasing to slightly elevated or perhaps elevated levels. A further high-speed stream with similar speeds may arrive at Earth on 07 May, although may be indistinguishable from that of the preceding high-speed stream. Geomagnetic activity is expected to be mainly Quiet on 04 and 05 May, with a slight chance of Active intervals should any peripheral CME effects occur at Earth. Activity should become Quiet to Unsettled from 06 May with the onset of the high-speed stream from one or more coronal holes with a very slight chance of isolated G1/Minor Storm intervals.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is most likely to persist at background levels with no solar radiation storms occurring. However count rates may increase with any notable flares that occur, with a slight chance of reaching the S1 Minor Radiation Storm threshold throughout, mainly from the complex region in the northeast quadrant.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	5	10	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	80	80	80	80
Very Active	R3 to R5 X	No	20	20	20	20

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	10	20
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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